

INDIANA STATE POLICE LABORATORY DIVISION



2016 ANNUAL REPORT

"The Indiana State Police Laboratory Division's strategic plan is to provide quality and timely crime laboratory services as required and expected by the client agencies we serve; accomplished by integrating new technologies, facilities upgrades, and continuing education toward advancements in the identification, collection, storage, and analysis of physical evidence, as well as in polygraph and photography services."

– Major Steven D. Holland, Laboratory Division Commander

Laboratory Division


Since its inception in 1936, the mission of the Laboratory Division is “to provide client agencies accurate, reliable, and timely crime laboratory services within the resources provided, and to manage the evidence security system of the Indiana State Police Department.” Toward these ends, in 2016 the Laboratory Division processed 1,162 crime scenes, analyzed and issued reports for over 17,600 cases completed, conducted 610 polygraph examinations, and secured over 300,000 items of evidence.

The Laboratory Division is organized into five sections: Biology, Chemistry, Comparative Science, Crime Scene and Field Support, and Management and Administration. The Biology Section consists of Serology, DNA, and CODIS (Combined DNA Index System). The Chemistry Section consists of the Drug Unit and the Microanalysis Unit. The Comparative Science Section consists of the Firearms Unit (including Integrated Ballistics Identification System or IBIS), the Latent Print Unit (including Automated Fingerprint Identification System or AFIS), and the Document Unit. Field Support consists of the Polygraph Examiners, the Crime Scene Investigators, and the District Evidence Clerks. Management consists of administrative and support personnel, the Laboratory Managers, the Regional Laboratory Evidence Clerks, the Photography Unit, and the Information Technology/Laboratory Information Management System (IT/LIMS) Unit.

INDIANA STATE POLICE LABORATORY DIVISION

MISSION STATEMENT

To provide client agencies accurate, reliable and timely crime laboratory services within the resources provided and to manage the evidence security system of the Indiana State Police Department.



Division Commander

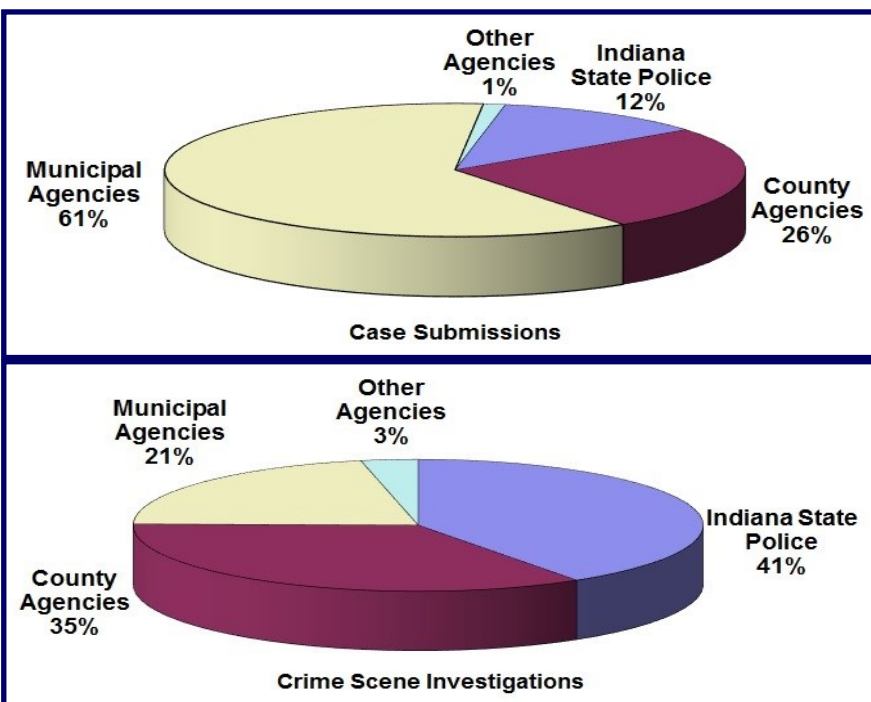
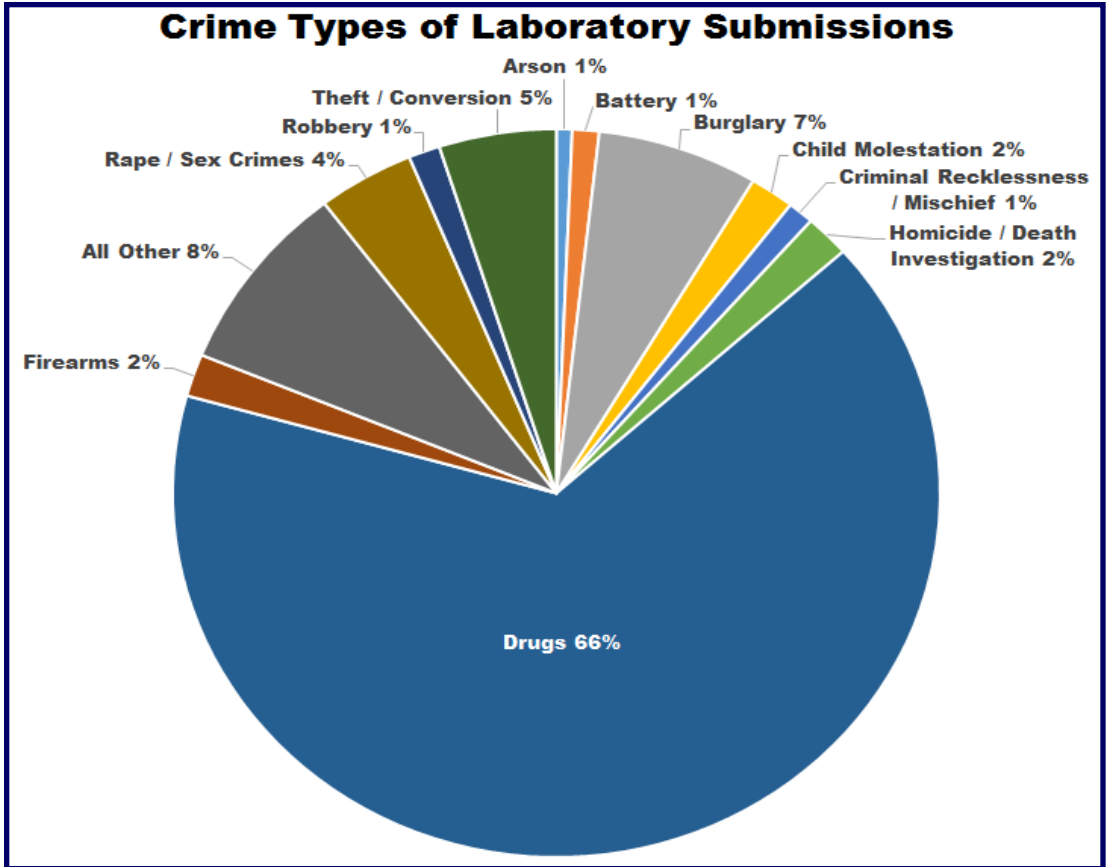
May 1, 2015

Date

The Laboratory Division accepts evidence associated with active criminal investigations for analysis at four regional laboratory locations - Evansville, Fort Wayne, Indianapolis, and Lowell. The four laboratories have been accredited by the American Society of Crime Laboratory Directors/Laboratory Accreditation Board (ASCLD/LAB) since 1991 and accredited to ISO 17025 standards since 2012. In 2014, the Indiana State Police Polygraph Unit achieved accreditation as well from PLEA, which is the Polygraph Law Enforcement Accreditation Board.

Types of Crimes and Requesting Agencies

The four regional laboratories provide forensic services at no charge to federal, state, county, and local agencies throughout the state of Indiana. These services include tests for firearms and tool mark comparisons; identification of controlled substances; trace examinations; questioned documents; latent prints; forensic biology/DNA and maintenance of the state's DNA database. The Division also provides polygraph examinations and crime scene investigations upon re-

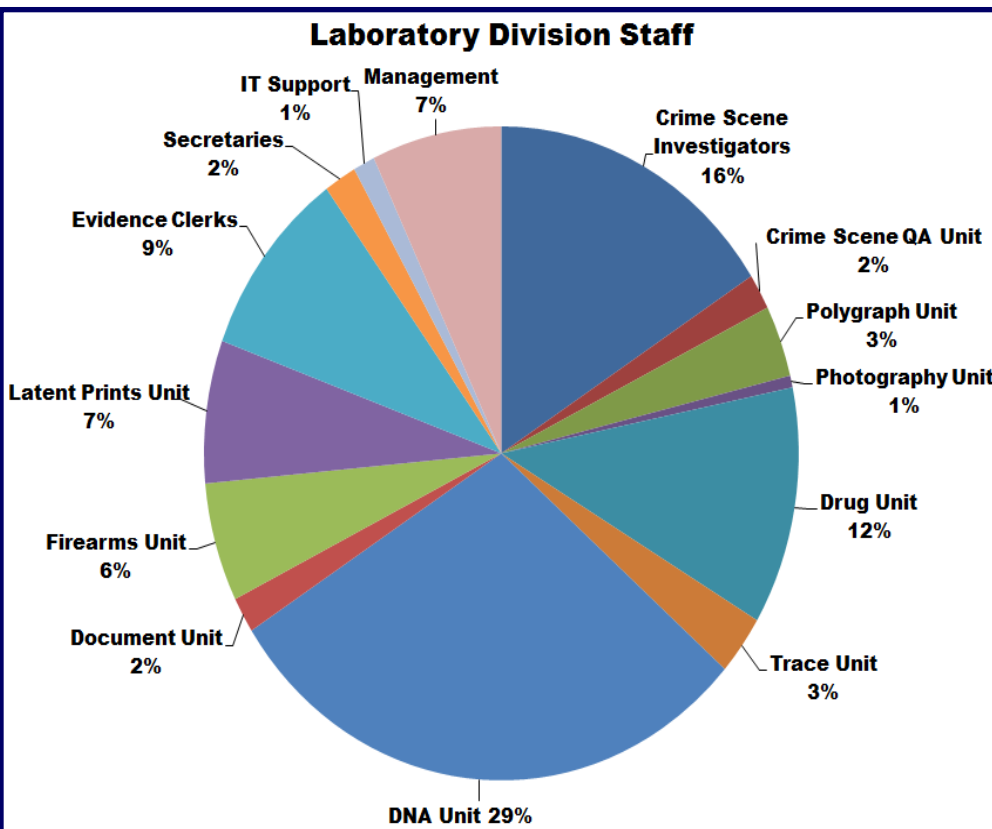
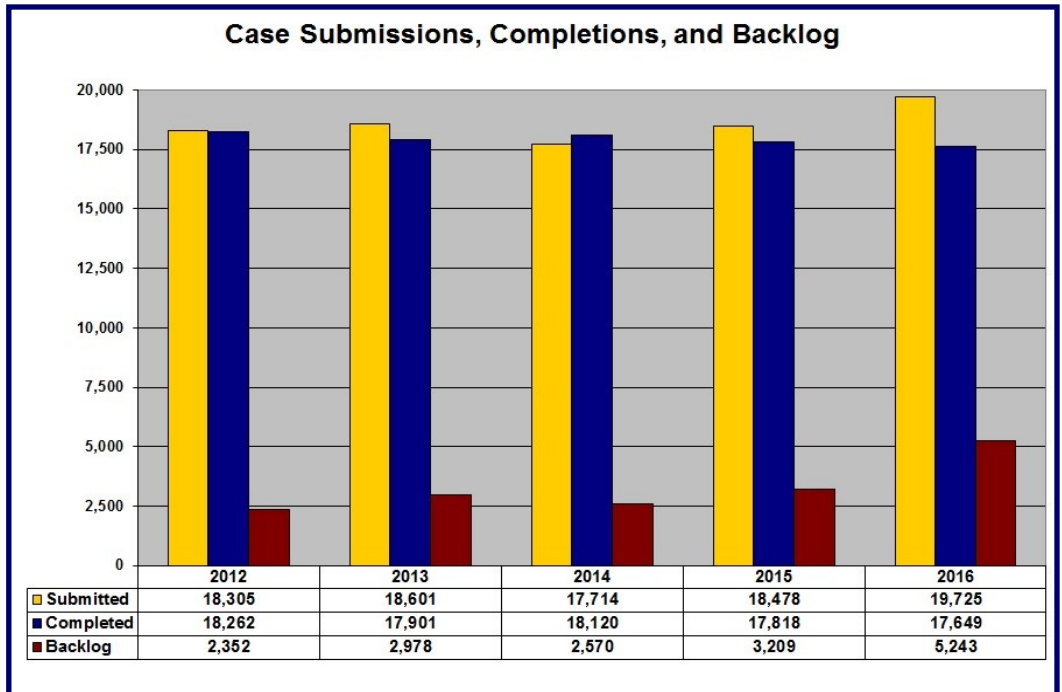


quest. The Laboratory Division received 19,725 new cases for analysis in 2016. Crime Scene Investigators responded to and worked 898 investigations involving 1,162 different crime scenes and the Polygraph Unit conducted 610 polygraph tests in 2016. The graph above shows the types of crimes for the laboratory cases analyzed in 2016.

As shown in the “Case Submissions” chart, the majority of cases for analysis are submitted from municipal agencies. The “Crime Scene Investigations” chart shows that over half of the crime scene investigations were completed for local and county agencies.

Case Submissions, Completions & Backlog

As shown in the “Case Submissions, Completions, and Backlog” graph to the right, the Laboratory Division received 19,725 cases and completed 17,649 cases in 2016. The Laboratory Division’s goal is to have 90% of backlog cases analyzed in 45 days or less from the date of submission. The backlog is defined as any case submitted that has not been completed. The average turnaround time at the end of 2016 for completing a case was 79 days, which is up from 58 days in 2015. The aging laboratory conditions at Evansville, Fort Wayne, and Lowell, as well a significant increase in drug submissions received for analysis, continued to negatively affect the turnaround times of our laboratory system in 2016.



At the end of 2016, the Laboratory Division employed a staff of 170 individuals providing analytical and support services. The chart to the left details the apportionment of the staff. Approximately 90% of the Laboratory Division personnel are directly involved in collecting, maintaining, and/or analyzing evidence. The Division’s personnel are active in the forensic community with multiple individuals holding office or working on committees of numerous forensic organizations. Approximately 64% of the Forensic Scientists are certified by a forensic organization. The last two pages of this report provides the Division’s organizational structure and contact information.

Regional Laboratories

All of the regional laboratories provide analysis in DNA, Drugs, Firearms, and Latent Prints. Microanalysis (Trace) examinations and Question Documents analysis are only available at the Indianapolis Regional Laboratory.

The 2016 case submissions at the four regional laboratories are shown in the table below.

	<i>Evansville</i>	<i>Fort Wayne</i>	<i>Indianapolis</i>	<i>Lowell</i>	<i>Totals</i>
DNA	170	155	3,092	511	3,928
Documents	0	0	42	0	42
Drug	1,242	2,292	6,528	2,060	12,122
Firearms	281	934	836	95	2,146
Fingerprint	164	301	623	217	1,305
Trace	0	0	182	0	182
Totals	1,857	3,682	11,303	2,883	19,725

The 2016 case completions at the four regional laboratories are shown in the table below.

	<i>Evansville</i>	<i>Fort Wayne</i>	<i>Indianapolis</i>	<i>Lowell</i>	<i>Totals</i>
DNA	161	155	2,847	504	3,667
Documents	0	0	35	0	35
Drug	1,063	1,936	5,542	2,035	10,576
Firearms	265	876	736	72	1,949
Fingerprint	197	174	631	212	1,214
Trace	0	0	208	0	208
Totals	1,686	3,141	9,999	2,823	17,649

The case backlogs at the end of 2016 are shown in the table below.

	<i>Evansville</i>	<i>Fort Wayne</i>	<i>Indianapolis</i>	<i>Lowell</i>	<i>Totals</i>
DNA	28	21	752	47	848
Documents	0	0	21	0	21
Drug	277	626	2,118	113	3,134
Firearms	75	254	247	29	605
Fingerprint	60	225	239	96	620
Trace	0	0	15	0	15
Totals	440	1,126	3,392	285	5,243

Biology Section

The Biology Section (53 staff) is organized into four casework units, plus the Combined DNA Index System (CODIS) Unit. This Section conducts analysis of biological samples including identification of body fluids (serology), nuclear and Y-STR DNA analysis, forensic relationship tests, blood stain pattern analysis, DNA analysis of convicted offender samples, and searches of the offender database for matching profiles.

In 2016, the Section completed 3,667 cases and 3,928 cases were submitted. The backlog was 848 at the end of 2016.

As a result of the above efforts, a total of 512 separate criminal investigations were aided through CODIS during 2016, including the following violent offenses: 9 homicides, 25 robberies, and 74 sex crimes. Types of hits included 6 National Forensic Hits, 155 National Offender Hits, 14 State Forensic Hits, and 355 State Offender Hits.

In 2016, the collection of offender samples from both Department of Corrections and county facilities continued, bringing in over 13,000 samples from previously untested convicted offenders. Over 12,700 offender samples were analyzed and entered into the database during the year, keeping the backlog at near zero. These samples were analyzed and entered into the database with an average turnaround time of 10 days from receipt to database entry. More than 1,000 crime scene profiles from casework were added to the CODIS database in 2016.

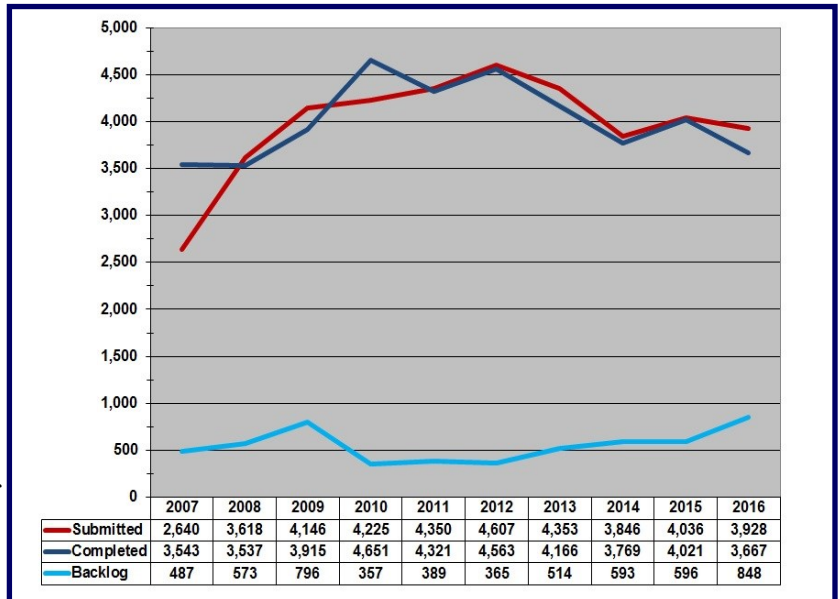


Photo: A new alternate light source which assists with locating potential biological evidence.

In 2016 the Biology Section validated and implemented use of an expanded DNA kit to meet the new 20 DNA marker requirement established by the Federal Bureau of Investigation. The new kit, which actually has 27 markers, expanded the number of general markers the Biology Section analyzes from 15 to 23 and added three new male specific markers.

Over 60% of submissions to the Biology Section were from property crimes. In one string of burglaries, DNA was recovered from a glove and a soft drink can that contributed to the identification and conviction of the perpetrator. Violent crimes were also submitted for DNA analysis. In one community several sexual crimes were linked by DNA to the same unknown person. A CODIS search quickly identified the person and led to an arrest, before additional crimes could be committed. In another case DNA led to an arrest in a cold case homicide from 2002.

Microanalysis Unit

The Microanalysis Unit (5 staff) provides analysis, comparison, and identification of automotive lamps, clandestine laboratory reagents, fibers, fire debris, glass, paints, plastics, safe insulation, tapes, and unknown materials.

The Unit completed 208 cases and received 182 submissions during 2016. The backlog was 15 cases at the end of the year, the lowest backlog since 2002.

The Unit is active in the forensic community participating in the American Board of Criminalistics (ABC), American Society of Trace Evidence Examiners (ASTEE), and Midwestern Association of Forensic Scientists (MAFS).

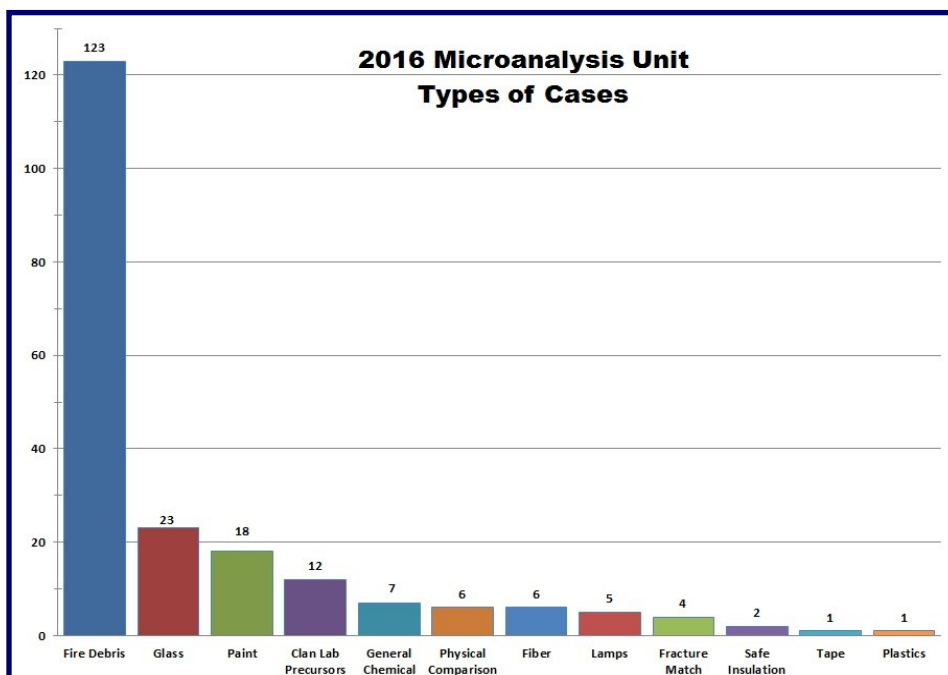
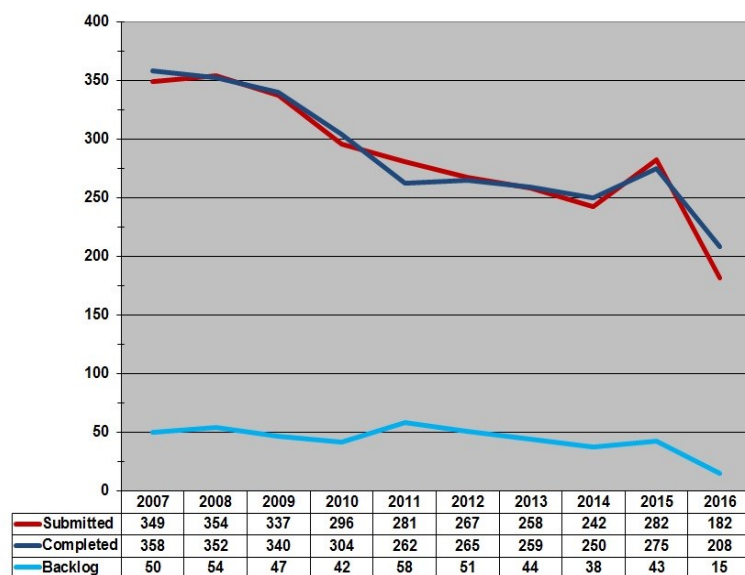


Photo: A fracture match plastic case.

The Microanalysis Unit compares many different types of samples. They use many different types of microscopes as well as analytical instrumentation to conduct their examinations and comparisons in an effort to provide associative evidence. The majority of cases worked by the Unit are fire debris cases as shown in the chart to the left.

Associative evidence, such as plastic, can be valuable evidence in the investigation and prosecution of a case. The physical and chemical properties of the questioned plastic are compared to a plastic standard. The Unit assisted an agency in 2016 with a hit and run case. The edges of clear plastic pieces from the crime scene were physically matched to the broken edges on a headlight assembly in the vehicle, as shown in the photo to the left.

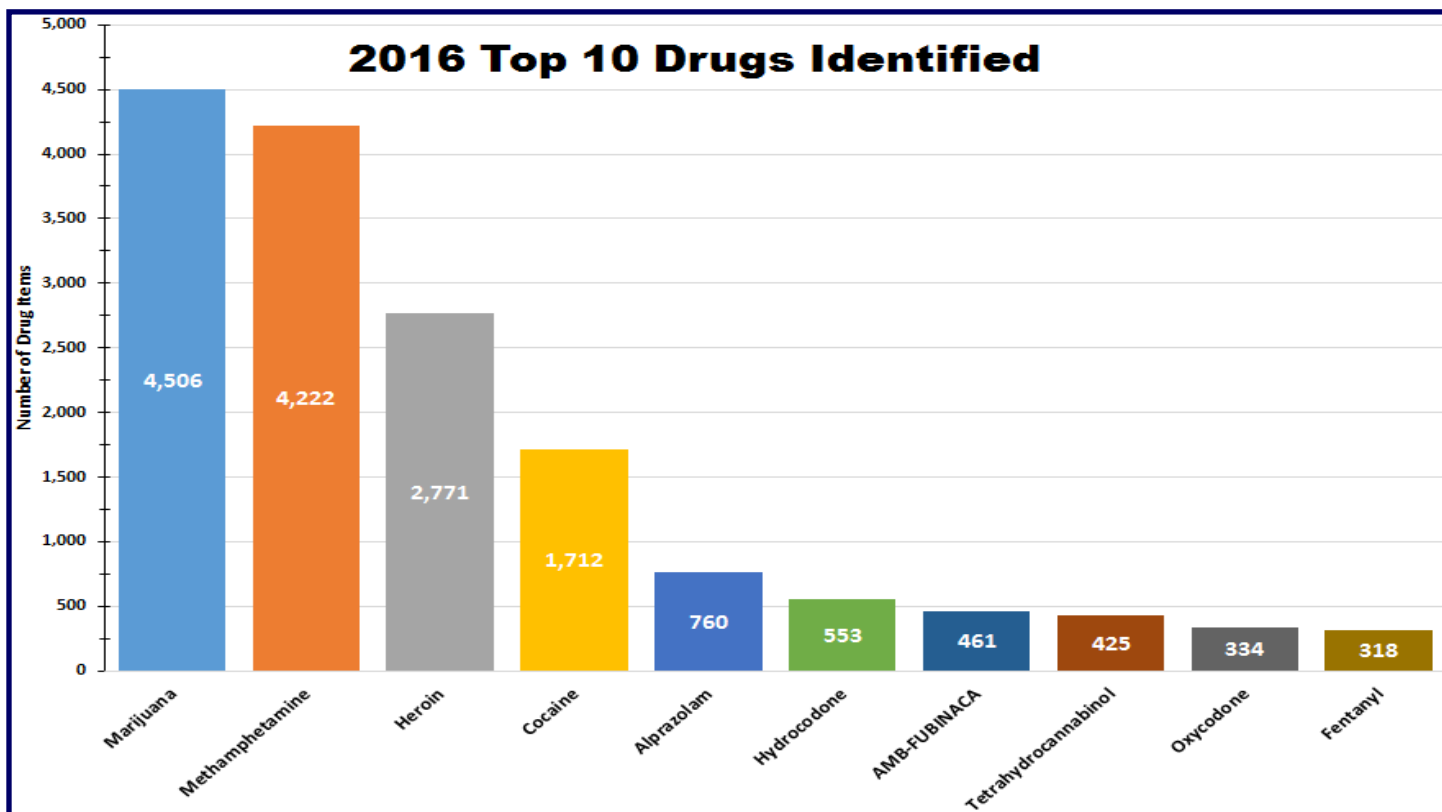
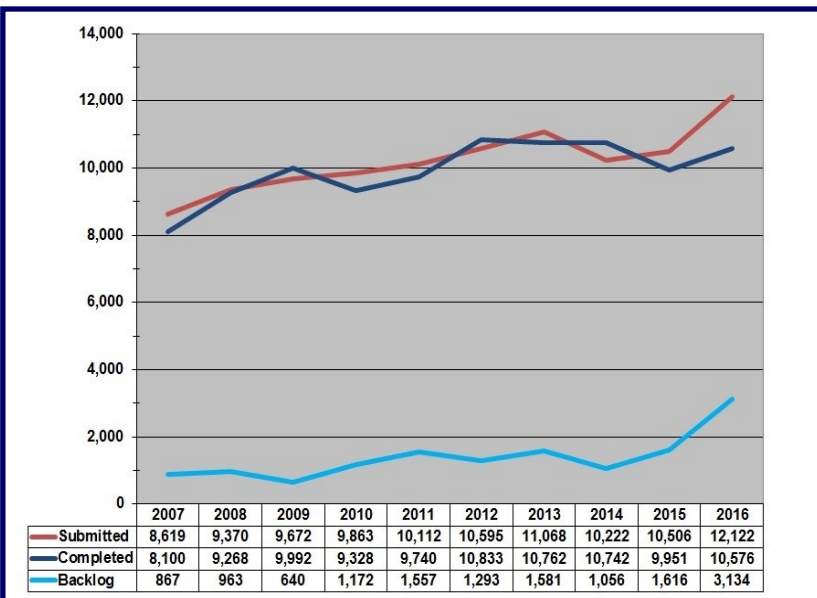
Drug Unit

The Drug Unit (20 staff) provides identification of controlled substances, non-controlled drugs of abuse, clandestine laboratory samples, and diluent materials found in drug preparations.

During 2016, the Unit analyzed 10,576 cases and received 12,122 cases, 15.4% increase from 2015. As a result of the significant increase of drug case submissions, the backlog increased to 3,134.

The Unit is active in the forensic community participating in the American Academy of Forensic Sciences (AAFS), American Board of Criminalistics (ABC), American Chemical Society (ACS), Clandestine Laboratory Investigating Chemists Association (CLIC), Midwestern Association of Forensic Scientists (MAFS), and Southern Association of Forensic Scientists (SAFS).

The top four most analyzed drugs were Marijuana, Methamphetamine, Heroin, and Cocaine as shown in the chart below. There was 5.7% decrease during 2016 in the number of Heroin items identified.



Drug Unit

(continued)

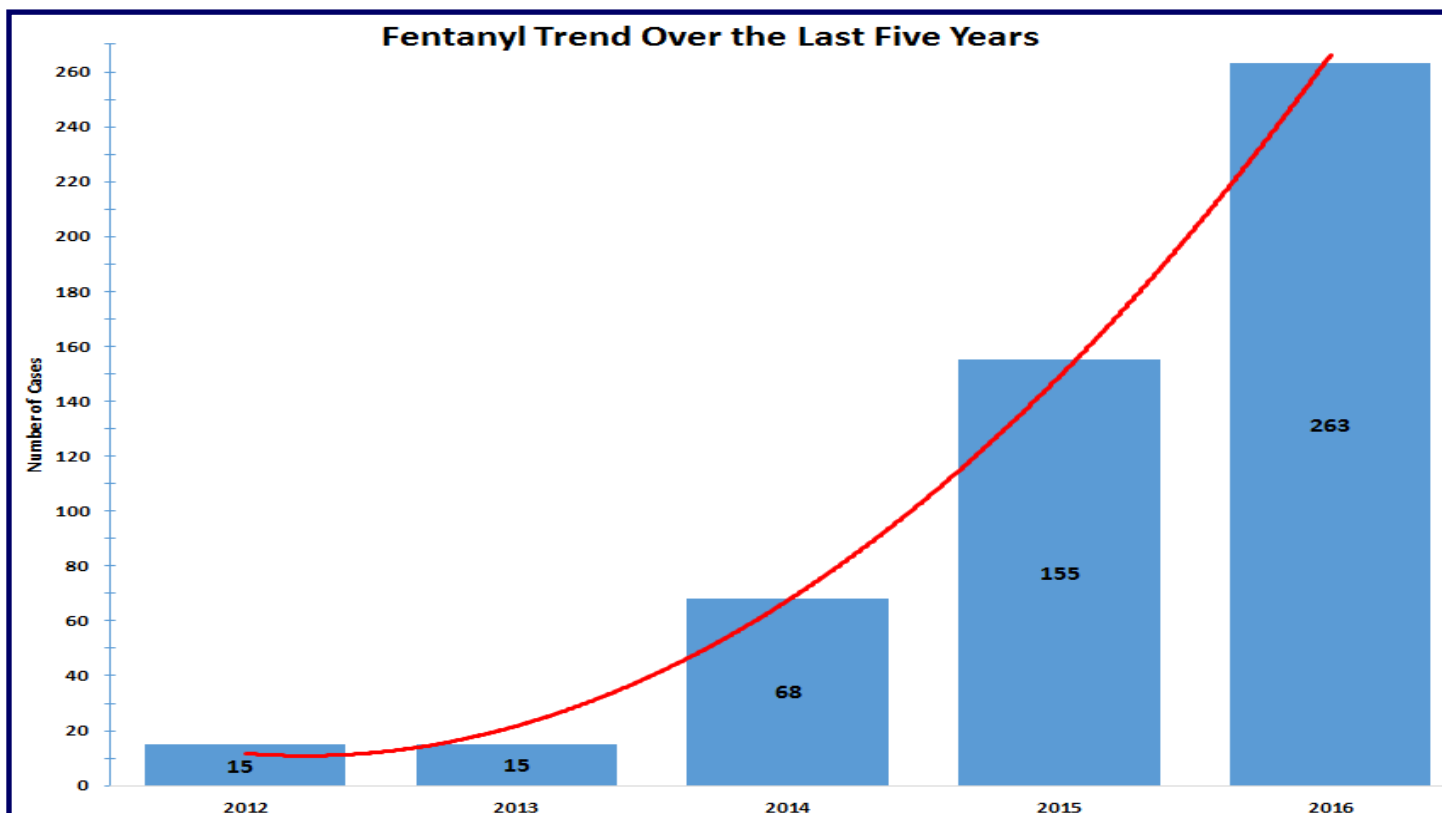
In 2016, there was a 70% increase in the number of fentanyl cases, as shown in the chart below. During 2016, the Drug Unit analyzed 263 fentanyl cases that included 318 items. Fentanyl has numerous analogs including benzylfentanyl, cyclopentylfentanyl, and sufentanil. Not all analogs, closely related chemicals, of fentanyl are controlled. The analogs can be challenging to distinguish since their chemical structures are similar, which requires longer turnaround time to complete the analysis. During 2016, the Drug Unit analyzed acetyl fentanyl, furanyl fentanyl, and carfentanil. Carfentanil is a tranquilizing agent for large animals, such as bull elephants, and is not approved for human use. Carfentanil is approximately 100 times more potent than fentanyl and can be lethal at about 2 milligrams.



Photo: Kilos of fentanyl analyzed by the Drug Unit in 2016.

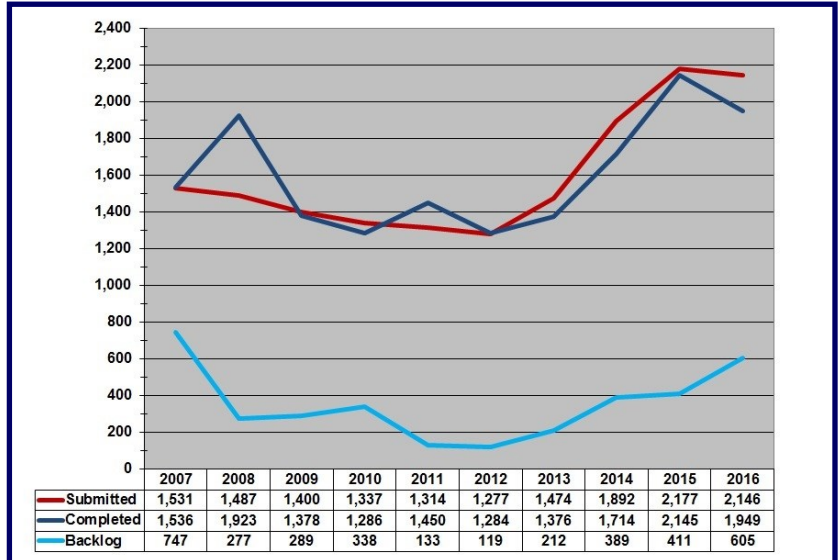


Photo: Analyst weighing a kilo of fentanyl.



Firearms Unit

The Firearms Unit (10 staff) provides comparison and identification of fired bullets and cartridge cases. The Unit also provides characterization of recovered ammunition components, function testing of firearms, examination and comparison of toolmark evidence, Integrated Ballistics Identification System (IBIS) database entry/inquiry for unsolved firearms related cases, muzzle to target distance determination, and serial number restoration. Members of the Unit also participate on the Superintendent's Advisory Committee on Firearms/Ammunition Selection by evaluating new ammunition and firearms for future procurement by the Indiana State Police Department.



The Unit worked 1,949 cases in 2016 while receiving 2,146 cases and had a backlog of 605 at the end of the year. The second year of over 2,100 submissions and an examiner in training contributed to the 47% increase in the backlog from 2015.



Photo: Test firing into the new Cotton Ballistic Shooting Trap.

The Firearms Unit is active in the forensic firearms community with members serving as elected board members or on committees for the Association of Firearm or Toolmark Examiners (AFTE) including past president and treasurer, the Forensic Science Standards Board (FSSB) that oversees the Organization of Scientific Area Committees (OSAC), and the National Integrated Ballistics Information Network (NIBIN) Users Conference. Six members of the Unit are currently certified by either the AFTE or the American Board of Criminalistics (ABC) or by both.

In 2016, a Cotton Ballistic Shooting Trap was purchased as shown in the photo to the left. This new equipment allows examiners to recover high-velocity rifle bullets.

In 2016, the Unit hosted a ballistic gelatin workshop. This workshop was attended by members of local police departments and crime laboratories. During the workshop ballistic gelatin was shot with various types of ammunition and through common barriers such as heavy clothing, wallboard, and other materials. The

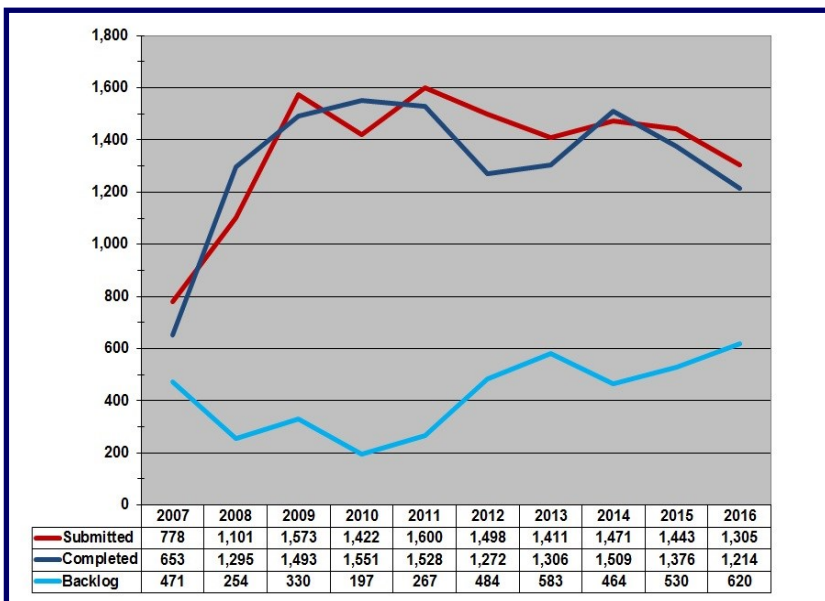
workshop allowed law enforcement and laboratory personnel to witness how various ammunition performs through different barriers prior to entering simulated human tissue.

During 2016, the Firearms Unit assisted local, state, and federal law enforcement with 72 Integrated Ballistic Identification System (IBIS) "hits" as shown in the chart to the right.

Laboratory	Hits
Fort Wayne	56
Indianapolis	16
2016 Totals	72

Latent Print Unit

The Latent Print Unit (12 staff) examines and compares unknown to known dermal friction ridge detail, which are found on fingers, palms, and soles of feet. Processing techniques include physical, chemical, and fluorescent development of latent print evidence. When a case is submitted without a suspect, the unknown fingerprints are entered into the Automated Fingerprint Identification System (AFIS, state system) and the Federal Bureau of Investigation's Next Generation Identification (NGI) databases. Potential candidates are generated by the system, but the comparison, identification, and verification processes are performed by forensic scientists. The Latent Print Unit can access all friction ridge archive files from AFIS/NGI for comparison purposes.



This access streamlines the process, and it allows the examiners to acquire the exact exemplar needed for comparison. The Unit also conducts examinations of footwear and tire impressions. The Unit uses the Sole-Mate Footwear Print Identification System Footwear Print Expert (FPX). This system stores shoeprint sole patterns for reference. Footwear impressions recovered from crime scenes can be searched in FPX database to potentially locate a manufacturer of a shoe, which can provide information to the investigator.

During 2016, the Unit worked 1,214 cases, had 134 AFIS hits, and received 1,305 cases for analysis. The backlog was 620 at the end of the year. The Unit also assisted with 355 Combined DNA Index System (CODIS) hit confirmations via print identifications.

The Latent Print Unit is active in the forensic community participating in the International Association for Identification (IAI) and the Indiana Division of IAI including president, secretary/treasurer, board member, and newsletter editor.

In 2016, the Latent Print Unit examined a footwear impression from a 2002 cold case homicide. Only the victim's shoes were available for comparison to the impressions from the crime scene. After analysis, the victim's shoes were excluded as having made the impressions. One impression was entered into FPX database. The impression demonstrated the same tread design as a Skecher's Rebs Gallant. The suspect in the case had confessed to wearing a pair of Skecher's brand "work" style shoes at the time of the crime, which was not known by the laboratory prior to the examination. The suspect's shoes were not available for comparison since the crime occurred many years ago. The analyst testified at the trial and the defendant was found guilty on all charges.

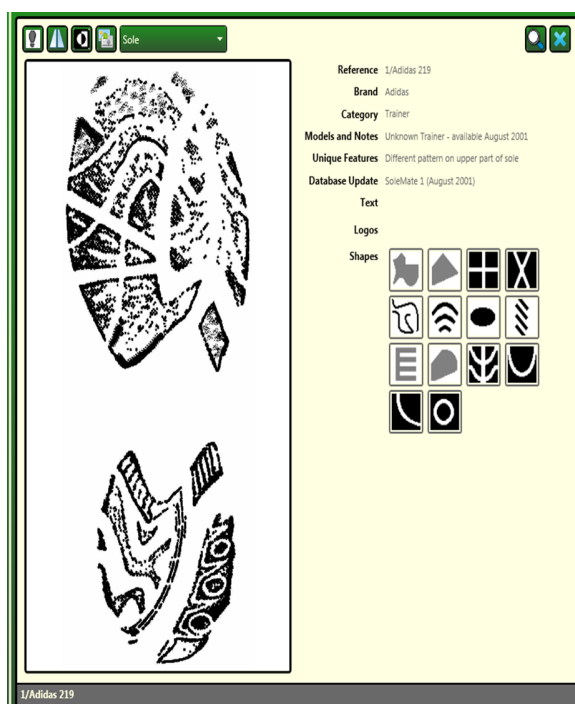
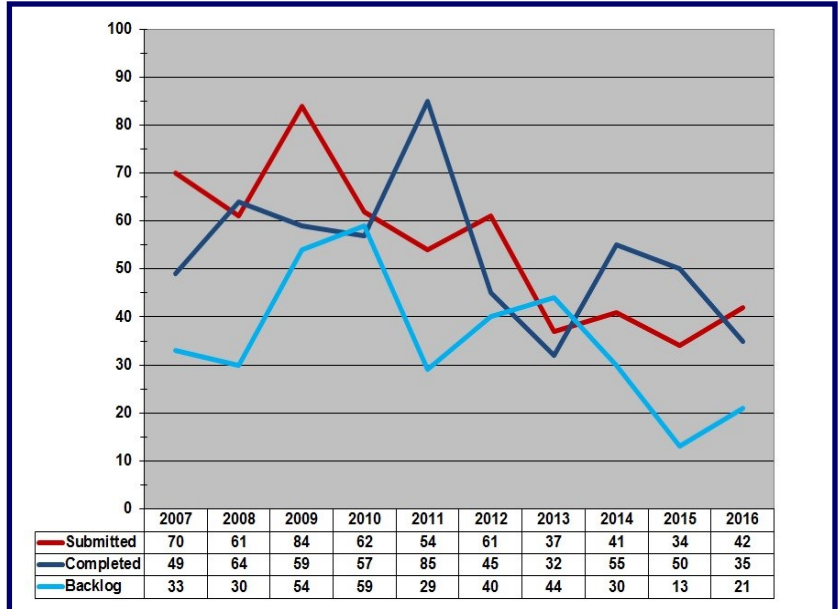


Photo: Example of information associated with a FPX hit (not from an actual case).

Document Unit

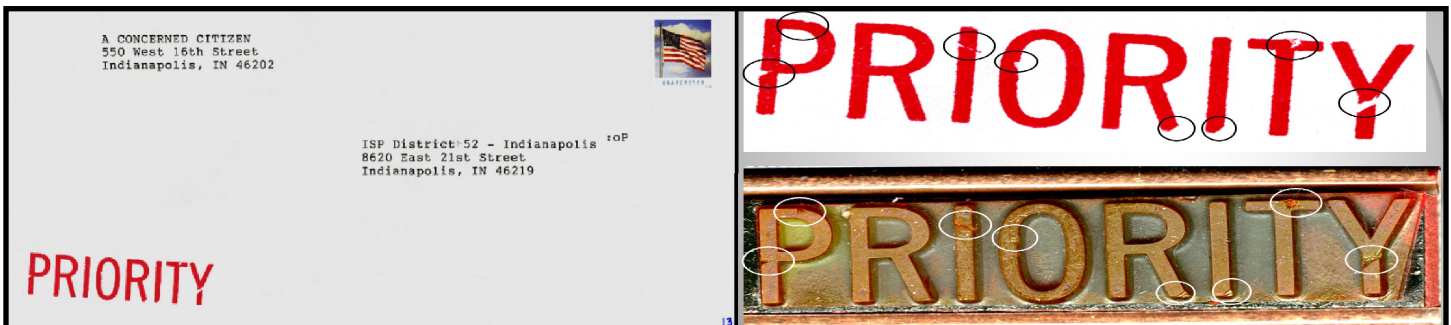
The Document Unit (3 staff) provides a range of examinations in order to answer questions about the authorship, authenticity, and background of documents. Document examinations include: the comparison of handwriting, hand printing, and signatures to known writing in order to identify or eliminate a subject as the writer; the development and decipherment of indented writing impressions; physical match examinations of torn, cut, or shredded documents; the classification and comparison of inks and writing instruments; the examination of printing processes to determine source or authenticity; detection of alterations, additions, deletions, or substitutions; decipherments of altered, erased, obliterated, charred, or water-soaked documents; and the determination of the sequence of events in the creation of a document.



The Unit completed 35 cases in 2016 and received 42 cases. At the end of 2016 the backlog was 21. Members of the Unit are active in the forensic community by participating in the American Society of Questioned Document Examiners (ASQDE), the Expert Working Group on Human Factors for Handwriting Examinations, and the Midwestern Association of Forensic Scientists (MAFS).

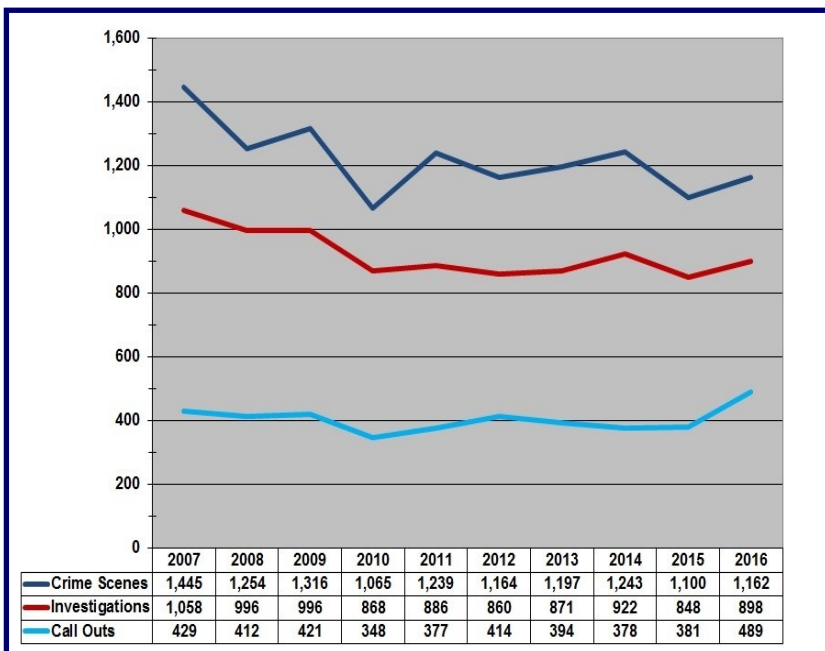
The Unit aided in a variety of investigations in 2016. In one case, the Unit was able to determine that a subject probably wrote a letter attempting to coerce a victim not to testify at trial. The analyst testified at the trial where the subject was found guilty on seven counts.

The Document Unit also provided three training classes in Evansville, Fort Wayne, and Versailles during 2016 to educate the law enforcement community. In total, 91 officers, detectives, and prosecutors attended this training. The training was interactive and included multifaceted hands-on exercises. An anonymous letter and envelope were provided to the participants as shown in the below left photo. They were asked to determine what type of investigative information the Unit could provide with or without a suspect. The image below right shows the hand stamp impression compared to the recovered stamp from the training exercise with circles around the individualizing defects in the stamp impression and stamp.



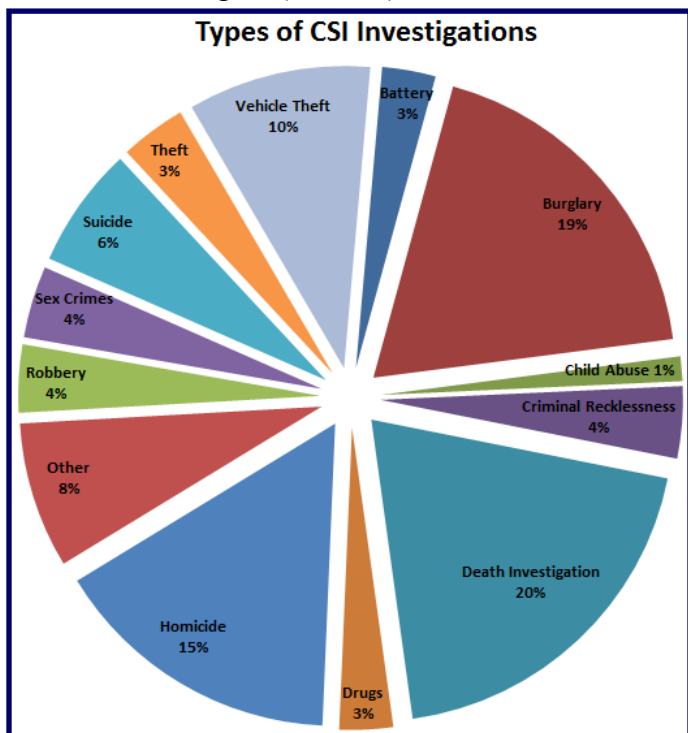
Crime Scene Investigation & Evidence

Crime Scene Investigators (31 staff) and Evidence Clerks (16 staff) provide technical crime scene processing, evidence storage and security, and court testimony as required. The Crime Scene Investigators' (CSIs) duties include identifying and collecting potential evidence, reconstructing the events of the crime, and physically linking potential suspects to the crime. Evidence Clerks are responsible for logging and tracking the chain-of-custody of evidence upon receipt into the Laboratory Division's possession, organizing storage of the evidence so it can be retrieved when needed, and the release or destruction of evidence as necessary. In 2016, the CSIs worked 898 investigations involving 1,162 crime scenes. They were called out 489 times with 3,814 hours of overtime and attended 181 autopsies.



Evidence Clerks handle thousands of items of evidence throughout the year either from accepting evidence from contributors at the regional laboratories or from state police officers for storing and analysis. The Evidence Clerks were responsible for the storage of over 300,000 individual items of evidence in 2016.

The Unit is active in the forensic community by participating in the Illinois Association of Property and Evidence Managers (IAPEM) and Indiana Division of the International Association for Identification (IN IAI).



As noted in the chart to the left, a wide variety of scenes were worked by the CSIs. Burglaries accounted for 19% of the cases and homicides, suicides, and death investigations combined for an additional 41%.

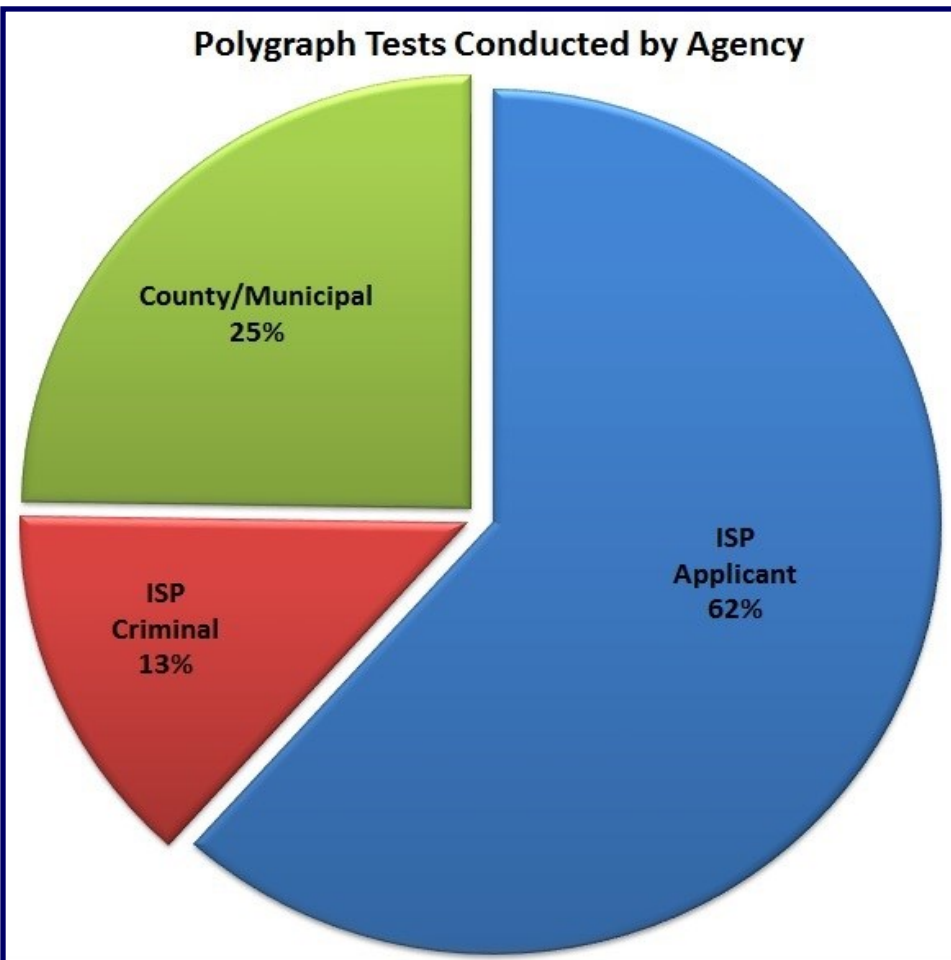
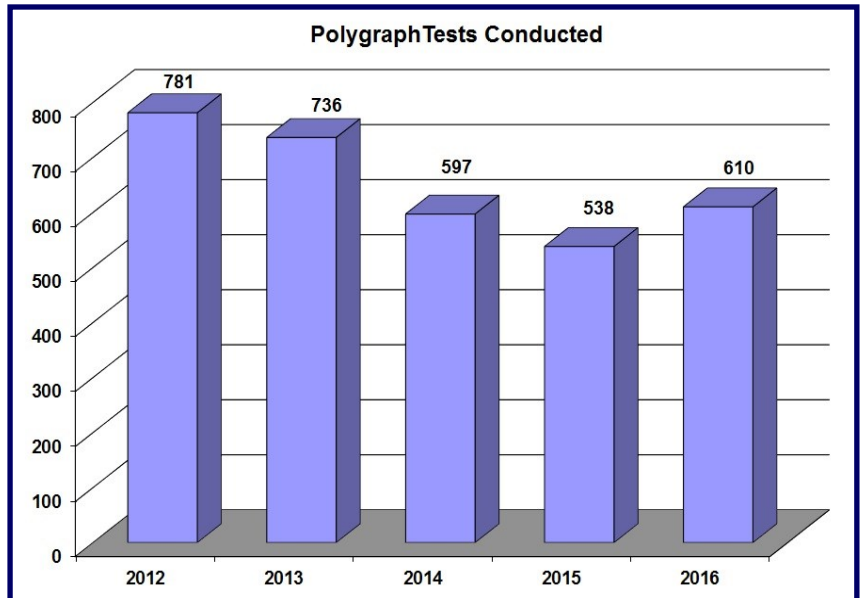


Photo: A CSI photographing a crime scene.

Polygraph Unit

The Polygraph Unit (6 staff) provides polygraph services in criminal investigations to the Indiana State Police and other state, county, and local law enforcement agencies. The Unit also conducts pre-employment testing for Indiana State Police positions including Trooper, Motor Carrier Inspector, Capitol Police, Evidence Clerks, and Fusion Center employees. In addition to these tests, the Polygraph Unit also conducts pre-employment polygraph examinations for Indiana Department of Natural Resources (DNR) Law Enforcement Division and the Indiana State Excise Police.

In 2016, the Polygraph Unit conducted 234 polygraph tests in criminal cases, clearing 29 cases, developing 14 additional leads, obtaining 28 confessions, and receiving 26 significant admissions. The Unit conducted 376 pre-employment polygraphs. The proportions of the tests conducted for the state police, county, and municipal agencies are shown in the chart to the left.



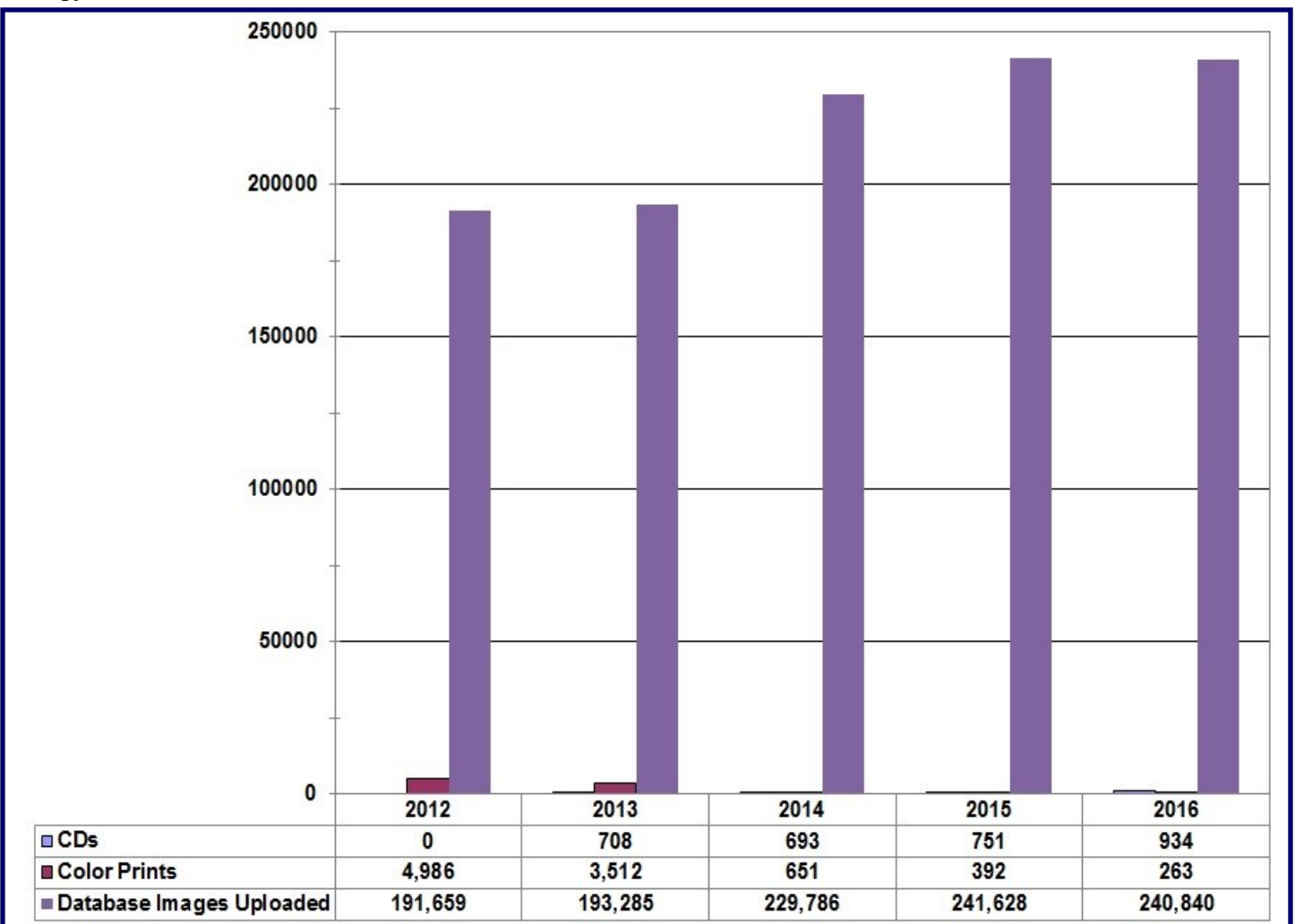
The Unit is active in the forensic community by participating in the American Association of Police Polygraphists (AAPP), American Polygraph Association (APA), and Indiana Polygraph Association (IPA).

The Polygraph Unit worked behind the scenes in many investigations and was able to help conclude several unique as well as high profile cases. The Polygraph Unit assisted Indiana State Police Bloomington District in finding the body of a one year old homicide victim in Spencer County in March 2016. During a polygraph examination, the suspect admitted to where he disposed of the body.

Photography Unit

The Photography Unit (1 staff) provides photography services for Indiana State Police (ISP) investigation personnel and Public Information Office. The Unit also maintains an electronic photo storage system for all Department criminal investigations and crashes. Digital images are uploaded, cataloged, and archived for future reference from the 14 ISP Districts. Over 240,000 digital images were entered into the database in 2016, and more than 1.5 million images have been added since the inception of the photo database in 2008. The Photography Unit printed 263 investigative color prints, which are now routinely provided on CDs due to a substantial cost savings. The decline in investigative prints over the years is shown in the graph below. The Unit provided 934 CDs to investigators and insurance companies.

The Laboratory Division deploys a Digital Asset Management system, called MediaSolv Commander, which makes images available to personnel at all district locations. While originally purchased for digital photos, the MediaSolv Commander system may be expanded to handle polygraph video, felony interview video, and 3D scanner data. Other applications, such as in-car camera systems, may be added to the system should such needs arise. This system is currently capable of storing 19 terabyte (TB) of data, but is easily expandable, and will provide a solid data storage infrastructure, allowing ISP to take advantage of current and future technology.



Quality Assurance & IT Support

The **Field Quality Assurance Unit** (3 staff) administers comprehensive training in crime scene processing to local law enforcement agencies as well as Indiana State Police (ISP) Crime Scene Investigators (CSI). The Unit assists the Indiana Law Enforcement Academy (ILEA) in certification of crime scene investigators for departments throughout the state. The Section Commander is a member of the ILEA CSI Certification Board. The Unit also provides specialized training to other agencies upon request. Members of the Unit regularly provide instruction at both the ISP Recruit Academy and the ILEA Basic Course.

The ISP Evidence System Quality Assurance Program annually audits each of the fourteen ISP district evidence storage facilities. Each district evidence storage facility has a complete inventory/audit every two years, which is a comprehensive review to account for every item stored at the facility. The Unit is occasionally requested to audit a local law enforcement agency's evidence system. These audits are completed when there is a criminal investigation involving internal issues with the physical evidence stored at the location.

Additionally, the Unit semi-annually assesses the work of all ISP CSIs. As part of the quality assurance program to ensure competency and properly functioning equipment, each CSI is given a proficiency test annually under the supervision of the Unit.

The **Laboratory Quality Assurance Unit** (2 staff) ensures compliance to laboratory and accreditation quality assurance standards. The Unit maintains updated and secure quality assurance documentation, oversees the implementation and continued corrective action compliance, ensures laboratory adherence to proficiency testing and witness critique requirements, and develops and conducts quality assurance related training for laboratory staff.

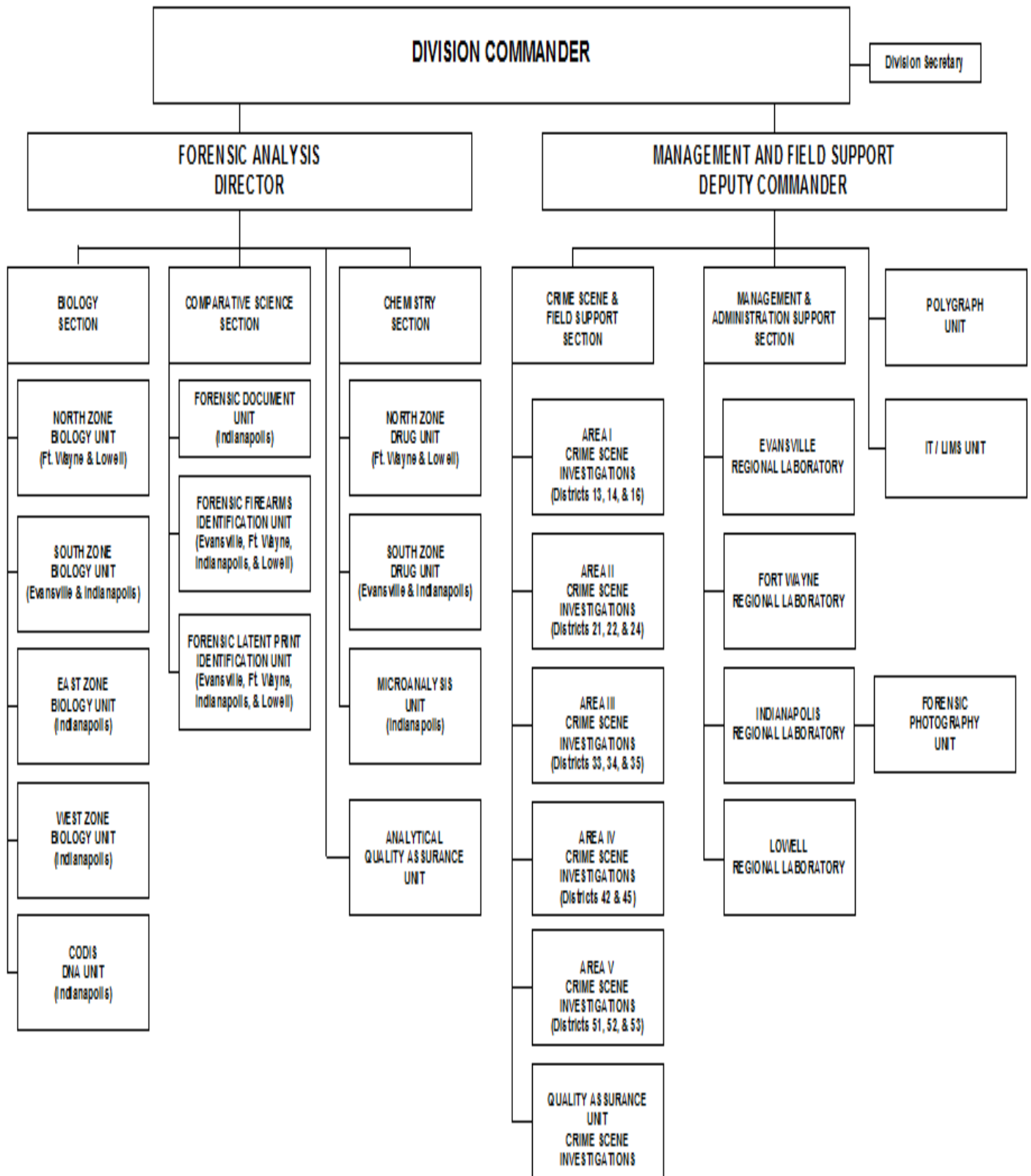
The four regional laboratories are accredited by the American Society of Crime Laboratory Directors/Laboratory Accreditation Board (ASCLD/LAB). ASCLD/LAB accreditation is a voluntary program in which a crime laboratory that participates must demonstrate that its management, personnel, operational and technical procedures, equipment, and physical facilities meet established quality standards. This Unit participates in the American Society for Testing and Materials-International (ASTM-I), the Association of Forensic Quality Assurance Managers (AFQAM), and the Organization of Scientific Area Committees - Quality Infrastructure Committee (OSAC-QIC).

The **Laboratory IT/LIMS Unit** (2 staff) has the primary duty of maintaining and administering the Laboratory Information Management System (LIMS). The LIMS tracks all evidence currently held by the Indiana State Police Laboratory Division and stores analytical results, records, and reports. This system is integrated with a web based reporting system called iResults, which provides the Certificates of Analysis (reports) to law enforcement agencies and county prosecutors.

The Unit also maintains and supports a digital workflow system (Mideo) utilized by the Latent Print and Document Units. This year the Unit transitioned the digital archive used for all ISP photos taken of accidents and crime scenes to a new system, the MediaSolv - Commander.

The LIMS/IT Unit supports Laboratory Division personnel in the four regional laboratories and 11 district locations. The Unit provides assistance with maintaining and troubleshooting other systems used by Laboratory Division personnel, that includes Automated Fingerprint Identification System (AFIS), Combined DNA Index System (CODIS), Integrated Ballistics Identification System (IBIS), analytical instrumentation, camera surveillance, door access/security, and phone systems.

Organizational Chart



Contact Information

Evansville Regional Laboratory

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Laboratory Manager: Joe Vetter
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812-867-3157
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Fort Wayne Regional Laboratory

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Fort Wayne, IN 46804

Laboratory Manager: John Vanderkolk
jvanderkolk@isp.in.gov
260-436-7522
800-552-0976

Indianapolis Regional Laboratory

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Laboratory Manager: Paulita Thomason
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Lowell Regional Laboratory

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Laboratory Manager: Paul Fotia
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Visit the Lab's website.

<http://www.in.gov/isp/labs/>